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Future Job Prospects in Singapore

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by Hoon Hian Teck

Summary

What forces have shaped our nation's employment and remuneration record so far? Where is Singapore's unemployment rate headed? What should policy-makers do about it? These are the questions tackled in this paper.

It is shown that based on our historical experience, it would be necessary to achieve an annual real GDP growth rate of 7.1 percent in order to keep the unemployment rate unchanged. Moreover, a one-percentage point shortfall of the real GDP growth rate below 7.1 percent in any given year results in a rise in the unemployment rate of 0.12 percentage points over the previous year. Consequently, if the economy is able to generate at most 5 percent real GDP annual growth rate (the high end of the range of official medium-term projections of our economy's growth rate, which is 3 to 5 percent), it would seem that the unemployment rate is set to rise from its current level based upon the historical relationship.

Is there any reason, however, to believe that the Okun's Law relationship for a fast-developing country like ours might be expected to change once we have reached the status of a mature economy as we now have become? After all, in a mature economy like the US, the critical real GDP growth rate required to keep the unemployment rate steady is only 3 percent. It is likely that the Okun's Law relationship would indeed shift as the economy matures. As workers adjust their expectations to the reality that the economy has reached a new lower growth regime and they incorporate their revised growth expectations in their wage bargaining, the unemployment rate can remain steady despite slower growth. This steady structural rate of unemployment is, however, likely to be higher than in the past.

In response to the worsened medium to long term outlook for the labor market, one is tempted to ask: Can anything be done by policy-makers to reduce the equilibrium rate of unemployment? I believe that reaching out for a weaker Singapore dollar in order to boost international competitiveness, and so to boost aggregate demand and hence

employment, or reaching out for budgetary deficits as a direct means to boost aggregate demand is unlikely to have a lasting effect on the structural rate of unemployment. Instead that it would be better to consider policies aimed directly at influencing equilibrium unemployment. One proposal is to introduce an employment subsidy scheme aimed particularly at low-skilled workers, which has the effect of increasing job creation directly. Increased effort to create a business-friendly environment to encourage new start-ups by ensuring minimal red tape and enabling relatively easy financing for them will also work to increase the pace of job creation. Finally, the work of the Workforce Development Agency aimed at retraining low-skilled and older workers to meet the skills demand of new jobs and then matching them to firms offering the job vacancies should help somewhat in bringing down the structural rate of unemployment as our small geographical area works to our advantage when it comes to job-matching.

Introduction

Having a job that pays a living wage is vital for maintaining one's sense of well-being. The benefits of employment go beyond just simply having the financial means to support a certain lifestyle. There are also important non-pecuniary benefits that one derives from working. Work provides us the mental stimulus from solving various sorts of problems. It provides us the satisfaction of achieving something significant. The social interactions developed at the workplace teach us inter-personal skills that are important for getting along with others. There are also community effects. In a society where most people are able to obtain productive employment, and there are job ladders to climb, it is possible to point to role models to motivate others to work hard to achieve worthwhile goals. Such a society is apt to be characterized by a sense of optimism and adventure, a willingness to try out new things.

In contrast, prolonged unemployment can be devastating both for individuals as well as for whole communities. Losing a job means more than forgoing earnings. When repeated attempts to land another job that would provide similar challenges and remuneration found in the previous job end up in failure, poor morale sets in. That can affect a person's relationship with others including other family members. Tempers flare up more often and communication becomes more difficult. In neighborhoods with a large number of people without a job, there are fewer role models to point to who can act to motivate others to work hard at school so that they can land a good job later on. Worse still, such an environment can fester a lack of regard for common property and encourage theft and crime. Prolonged unemployment therefore produces social costs that exceed

private costs, which suggests that society should be willing to spend more resources than the sum of what all individuals on their own would be willing to spend to increase the number of people who are economically employed.

One thing should be clear, however, at the very outset. No society can hope, by sheer use of state-mandated policy alone, to engineer a state of full employment. Such an outcome, even if achievable, would not be characterized by the quality of dynamism and spontaneous discovery needed for an enterprising and well-functioning economy. Consequently, for a society to provide a rich array of jobs that also offer good pay, it would be necessary to have a relatively large and active private sector. That is not to say that the public sector itself cannot be a major employer in a dynamic economy. It can be. However, apart from the direct employment generated by the state's provision of public goods, the bulk of all hiring done by the public sector should generally be *derived from* the need to develop the right institutions to support a thriving private sector that will be well-equipped to catch the business opportunities that technology and an evolving world economy provide.

As our nation completes its forty years of independence with job losses hogging the headlines in recent years, a foremost question on the mind of many people as they look to the future might be, "What are my job prospects?" Can an economist pin down a basic framework for answering this very important question? What forces have shaped our nation's employment and remuneration record so far and do we have reason to believe that these forces have changed? If so, in what direction have they changed? This

chapter will attempt to develop such a framework, and use it to answer the questions just posed.

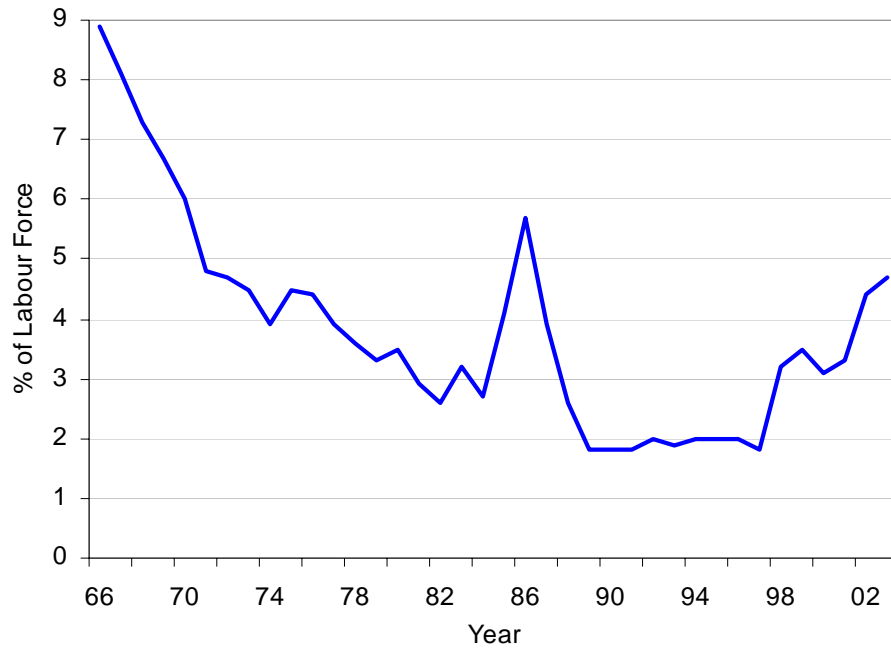
In looking ahead to the future, and thinking about future job prospects, it is useful to understand where we were and how we got to be where we are today. This is because there is a certain momentum that carries an economy along during its catch-up phase, which impacts hugely on job generation, and it will be important to determine if such a phase is largely over. In my conceptualization, the catch-up phase can be likened to the arrival of a big wave. It carries in its wake a rising tide that lifts many boats. When that catch-up phase is over, however, the economy must settle down to a more normal pace that more mature economies invariably find themselves. Some questions to be asked about such mature economies are: What determines the equilibrium volume of joblessness in such mature economies? Do we have evidence that there exist periodic waves that may not be of the same scale as those seen during the catch-up phase but that are nonetheless big enough to generate a sufficiently large number of challenging jobs? What characteristics of the economy will enable it to ride on such periodic waves?

This chapter is organized as follows. In the next section, we examine our employment record according sub periods which I identify as the catch-up phase (1966-1985), the golden decade (1989-1998) and the turbulent years (1998-2003). We then turn our attention to the future with the focus to answer two questions: Where is Singapore's unemployment rate headed? What should policy-makers do about it? We then end with a conclusion.

Our Employment Record

Figure 1 shows how the unemployment rate, that is, the ratio of the number of unemployed workers to the size of the labour force or alternatively the share of the workforce without a job, has evolved since 1966. We can identify some patterns. From 1966 to 1985 (the “catch-up phase”), there was a fairly steady decline of the unemployment rate going from close to 9 percent in 1966 to just over 3 percent in 1985. A sharp spike in the unemployment rate occurred over 1986 to 1987 but this gave way to an unusually low and stable rate of unemployment that hovered around 2 percent in the next decade---the “golden decade”---from 1989 to 1998 before it started climbing up since the onslaught of the Asian financial crisis---the “turbulent years”---to reach over 4.5 percent in 2003. (Table 1 provides some average numbers for the unemployment rate for different time periods.) Figure 2 shows how workers’ real wage earnings---their pay in dollars deflated by the consumer price index---have changed since 1985. We find a dramatic recovery of real wage earnings after the sharp downturn of 1986-87 followed by sharp wage gains during the golden decade of accompanying 2-percent unemployment rate. This period was followed by sharper fluctuations in real wage earnings during the turbulent years of 1998-2003.

Figure 1
Unemployment Rate



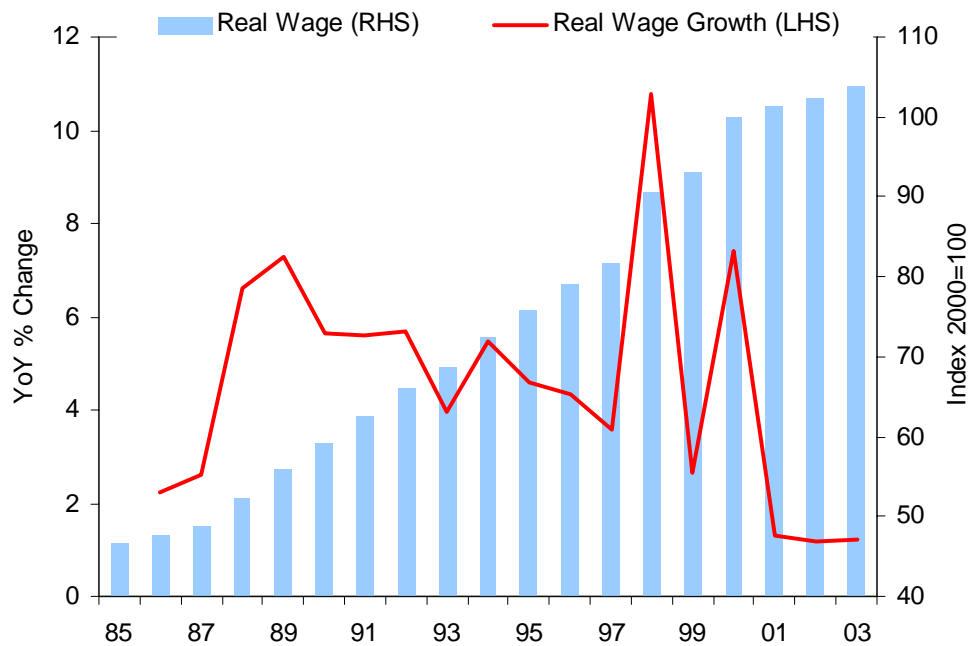
Source: Ministry of Manpower

Table 1
Average Unemployment and Inflation Rates (Various Grouped Years)

Decade Averages			Semi-decade Averages			Era Averages		
Years	Unemployment	Inflation	Years	Unemployment	Inflation	Years	Unemployment	Inflation
1966-75	6.0	5.5	1966-70	7.4	1.2	1966-90	4.5	3.8
1976-85	3.4	3.5	1971-75	4.5	9.7	1991-03	2.9	1.4
1986-95	2.9	1.5	1976-80	3.8	3.8			
1996-03	3.3	0.7	1981-85	3.1	3.3	1991-97	2.2	2.3
			1986-90	3.6	1.3	1998-03	3.7	0.4
1970-79	4.4	5.9	1991-95	2.2	2.6			
1980-89	3.5	2.8	1996-00	2.8	0.9			
1990-99	2.4	1.9	2001-03	4.1	0.4			
2000-03	3.8	0.6						

Source: Ministry of Manpower

Figure 2
Real Wage Level and Real Wage Growth



Source: Ministry of Manpower

The Catch-up Phase

How do we account for the steady decline of the unemployment rate in the first two decades since independence? According to Keynesian economics, the monetary authority through an increase of the money supply can engineer an expansion of employment by generating an inflation rate that exceeds the level expected by the public. One mechanism through which this can occur is the following. Imagine that in any period, a fraction of the workforce, say half the workforce, negotiates its wage contract in dollar terms for the current and next period. Given the capital stock and technology, which determine workers' productivity at their job, the nominal wage will be set based upon the inflation rate workers expect to prevail during the entire term of the contract. In the next period, the other half of the labour force negotiates its two-period wage contract. Consequently,

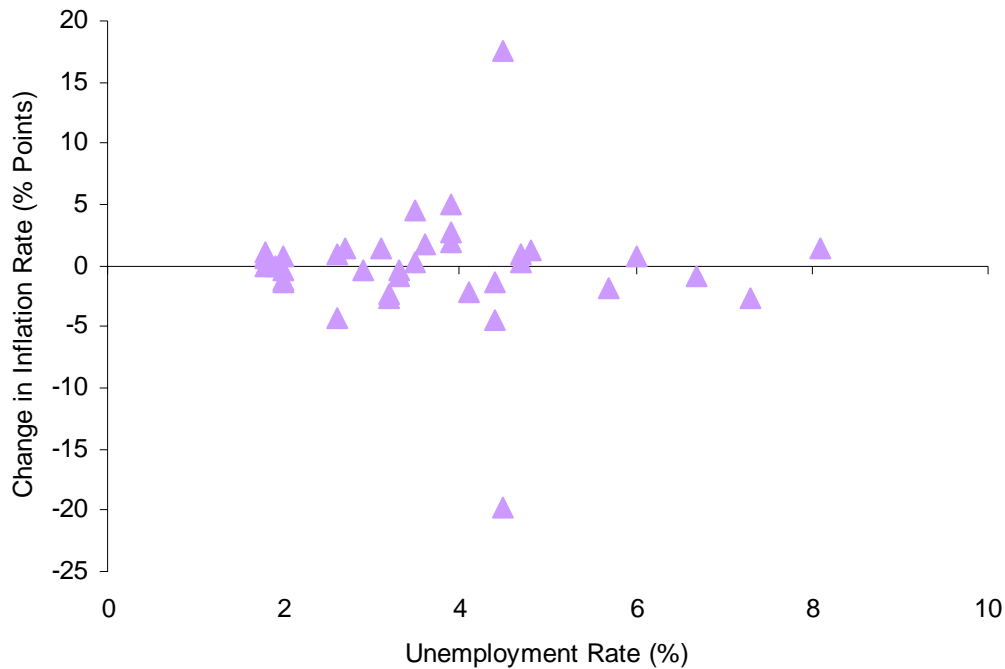
in any given period, the economy-wide nominal wage is an average of the wages set in the two overlapping wage contracts of the two halves of the labour force. If the monetary authority engineers a monetary expansion, the economy will experience an inflation rate that turns out to be higher than the level expected by the half of the workforce that negotiated its wage in the previous period. Consequently, firms will find that, at given levels of workers' productivity, it is profitable to hire more workers, at any rate, more than the previous number it had earlier planned to hire. An economic boom with an accompanying employment expansion would have been engineered through a monetary stimulus.

But are such employment gains permanent? Since the public soon adjusts its expectations of the inflation rate to the higher rate actually experienced, the monetary authority would have to constantly generate ever higher rates of inflation in order to produce the needed "inflation surprise" to keep the unemployment rate below the "natural rate of unemployment"---the inflation surprise-free rate of unemployment. This is the accelerationist hypothesis of Milton Friedman (1968) and Edmund Phelps (1968) derivable from their expectations-augmented Phillips curve. If, for simplicity, we suppose that the public forms its expectation of this period's inflation rate solely on the basis of the past period's inflation rate, the Friedman-Phelps formulation will generate a negatively-sloped schedule relating the change in inflation rate to the contemporaneous rate of unemployment; where the schedule intersects the horizontal axis, we should obtain a unique natural rate of unemployment. To keep the economy's unemployment

rate permanently below the natural rate of unemployment, we would have to steadily raise the inflation rate.

Do we have any evidence that the steady decline in Singapore's unemployment rate in the two decades after it gained independence was the result of an activist monetary authority stimulating aggregate demand by engineering monetary expansions? If this was the case, and if we accept the Friedman-Phelps natural rate hypothesis, we would expect to see the decline in unemployment rate occurring in tandem with steadily rising inflation rates. What do we find in the data? Figure 3 plots the change in inflation rate against the rate of unemployment for the period 1966-2003. What we fail to detect in the figure is an unambiguously negatively-sloped schedule giving a unique intersection with the horizontal axis. Instead, we find that there has been relatively little variation in the inflation rate but fairly large variations in the unemployment rate. As Table 1 reveals, when the average decadal unemployment rate of 6.0 percent for the period 1966-75 fell to 3.4 percent for the period 1976-85, a near halving of the original level in the previous decade, the average decadal inflation rate did not rise but instead fell from 5.5 percent to 3.5 percent. What this suggests is that the steady decline of Singapore's unemployment rate in the first two decades after its independence was not the result of a decline in cyclical unemployment brought about by monetary expansion but rather reflected primarily a decline of the natural rate of unemployment itself.

Figure 3
Scatter Plot of Change in Inflation Rate vs Unemployment Rate



Source: Ministry of Manpower (Unemployment rate); International Financial Statistics (Inflation rate)

If we are right that the bulk of the decline of the unemployment rate observed over the two decades after independence was largely structural in nature, the next question to ask is, “What determines an economy’s natural rate of unemployment, alternatively referred to as the structural rate of unemployment and the equilibrium rate of unemployment?” To answer this question, we propose to apply to our data a conceptual framework that can be summarized in two diagrams, one a Beveridge curve diagram and another a Marshallian labour-market diagram. The Beveridge curve tells us that, at a given separation rate that breaks up a worker-firm match or alternatively at a given retrenchment rate, a decrease in the unemployment rate requires an increase in the job vacancy rate to make the inflow into the unemployment pool equal to the outflow

from the unemployment pool.¹ Thus the Beveridge curve is represented by a negatively-sloped schedule in Diagram 1. There are two factors that shift the Beveridge curve. An increase in the job separation rate as well as an increase in “job mismatch” shift out the Beveridge curve.

To pin down the actual combination of vacancy rate and unemployment rate that we can observe in equilibrium, we need to determine the actual level of labour-market tightness, which we represent by the ratio of the vacancy rate to the unemployment rate. Thus we say that the labour market is tight if there are more job vacancies per unemployed worker. If we can determine the actual level of labour-market tightness, a ray from the origin can be drawn as illustrated in Diagram 1 to give us the equilibrium rate of unemployment as well as the corresponding job vacancy rate. But how do we determine the actual level of labour-market tightness? For this we turn to Diagram 2, which depicts the Marshallian labour-market equilibrium.

¹ If we imagine a sink with the water level representing the number of people employed, the size of water outflow must be matched by an equal-sized water inflow if we are to maintain an unchanged rate of unemployment. If the rate of outflow (given by the job separation rate) is unchanged, maintaining a higher water level (that is, a lower rate of unemployment) means maintaining a larger size of water outflow that must be matched by an equal-sized larger water inflow. That larger inflow has to be drawn from a smaller pool of unemployed people so the rate at which an unemployed person can be successfully matched to a job (the job accession rate) must correspondingly be raised. The latter, in turn, is achieved when the vacancy rate is increased. Hence we obtain a negative relationship between the vacancy rate and the unemployment rate along a given Beveridge curve.

Diagram 1
The Beveridge Curve

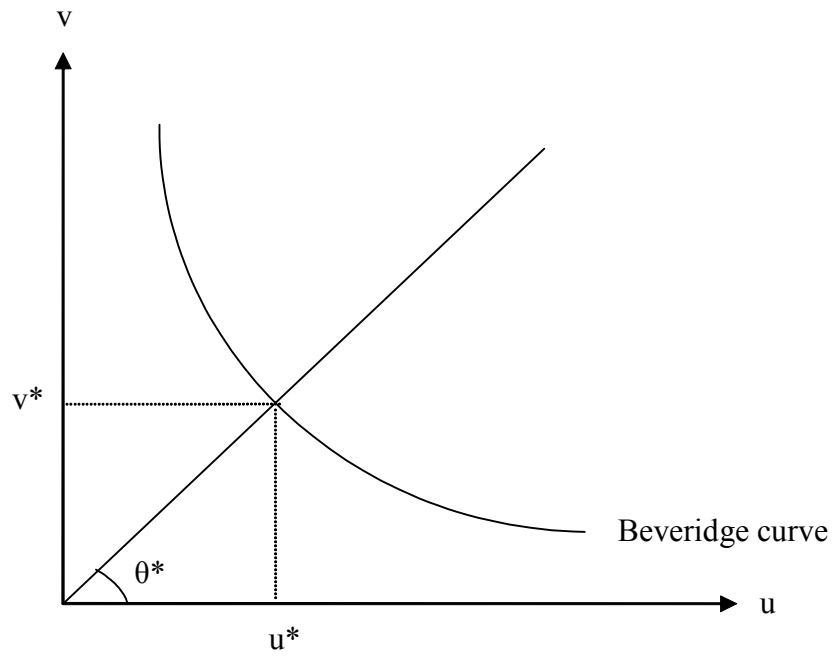
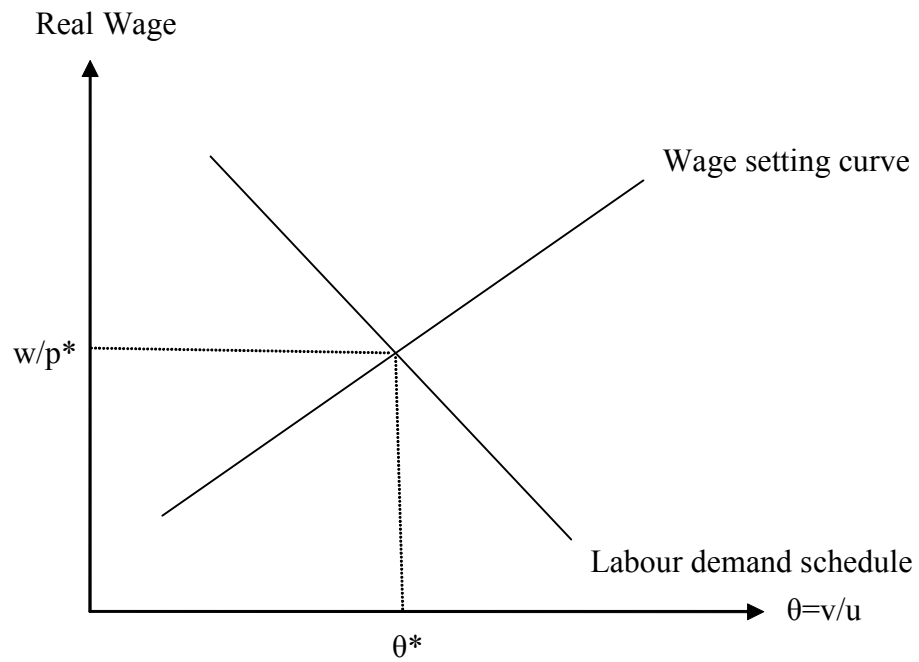


Diagram 2
Marshallian Labour-Market Equilibrium



Note

v : Vacancy Rate
 u : Unemployment Rate
 w/p : Real Wage

The upward-sloping schedule in Diagram 2 gives us the wage-setting curve. We can interpret this curve as telling us what wage workers bargain for at any level of labour-market tightness. When the labour market is very tight, so there are more job vacancies per unemployed worker, the wage that workers feel empowered to bargain for is accordingly high. There are other factors, however, that affect the wage that workers feel empowered to bargain for apart from the extent of labour-market tightness. If workers have vast resources to draw upon in the event that they lose their jobs, they will feel emboldened to bargain for higher wages at any given level of labour-market tightness. As an example, if the state provides more generous unemployment benefits---so the replacement rate is higher and the duration of receipt of the benefit is longer, say---there will be an upward shift of the wage-setting curve. An increase in workers' wealth will also have the effect of shifting up the wage-setting curve. When workers have accumulated a large stock of assets, they can enjoy a big stream of non-wage income, which makes them less fearful about losing their jobs. Accordingly, they are more willing to press for higher wages at any given level of labour-market tightness.

The downward-sloping schedule in Diagram 2 gives us the labour-demand curve. We can think of this schedule as saying that the wage that the firm can afford to pay each worker, and yet maintain a normal level of profits, declines as the measure of labour-market tightness increases. As the labour market becomes tighter, so there are fewer unemployed workers for each job vacancy, it becomes increasingly harder for a firm to fill up that vacancy. Hence the expected time duration of a job vacancy or of maintaining an unfilled position is longer. It is, however, expensive to keep a position unfilled for too

long in the hope of finding a suitable job candidate. Apart from the direct expenses incurred to advertise that position, the capital already committed to open that job position is left unutilized meanwhile and that is an opportunity cost to the firm. The interest value associated with this total cost must be subtracted from the marginal value product of the worker to figure out how much the firm can afford to pay each worker and yet maintain normal profits. In addition, a job separation that destroys the worker-firm match acts like an interest cost since it shortens the life of a successful job match requiring the reopening of a new job vacancy. As the level of labour-market tightness increases, the duration of a job vacancy increases and the associated interest cost of maintaining the job vacancy increases so the affordable wage decreases imparting a negative slope to the labour-demand curve. An increase in labour productivity, whether achieved through capital deepening or technological improvement, shifts the labour-demand curve to the right. On the other hand, an increase in the interest rate as well as an increase in the job-separation rate act to shift the labour-demand curve to the left.

What is the reason the unemployment rate was so high in 1966? The hypothesis put forth here is that the shortage of capital and lack of access to technology kept the marginal value product of labour low at given interest rates so the labour demand curve in Diagram 2 is far to the left. Juxtaposed against the wage-setting curve, the level of labour market tightness is accordingly low with few vacancies per unemployed worker. The ray from the origin in Diagram 1 then has a very gentle slope so its intersection with the Beveridge curve corresponds to a low rate of vacancy and a high rate of unemployment.

What then caused the unemployment rate to glide downwards in the following two decades? Answering this question requires us to get back to some fundamental questions in development economics: Why are some nations poor while others are rich? If the lack of capital is the cause of poverty, why doesn't capital flow from the capital-abundant country to the capital-scarce country where the law of diminishing return to capital would suggest that the rate of return in the latter should be correspondingly high? The answer must be that in the mind of investors, the mere fact that capital is scarce does not imply that a unit of investment will invariably fetch a higher return. Something about the quality of the nation's workers especially their work attitude, which affects the amount of work absenteeism and shirking, as well as the overall quality of the business environment or the quality of the social infrastructure matter for investors' evaluation of the return from setting up a business overseas. What seems to have happened is that the Singapore government succeeded in convincing foreign investors in the first few years after independence that it had the right workforce and institutional environment to make investing here a worthwhile activity for them. As a result, it set in motion a huge inflow of foreign capital that brought along with it new technology and markets.

The manufacturing sector might have been a leading sector whose expansion was propelled by inflows of foreign direct investment but it also had important linkages with the rest of the economy. Some locally-owned business activities were developed to support a thriving manufacturing sector; as workers found employment in the manufacturing sector, their spending power also increased to support the services sector. As incomes rose and public finances increased, the public sector also expanded to meet

the demands of both businesses as well as the population. As a result, employment expansion occurred across the different sectors in the economy. In terms of Diagram 2 then, there was a steady rightward shift of the labour demand curve over the following two decades leading to rising real wages and increasing labour-market tightness. In Diagram 1, the ray from the origin moved in a counter-clockwise direction leading to a decline in the unemployment rate and a rise in the vacancy rate. To meet new job vacancies that were opening up, the government increasingly had to rely on a pool of foreign workers.

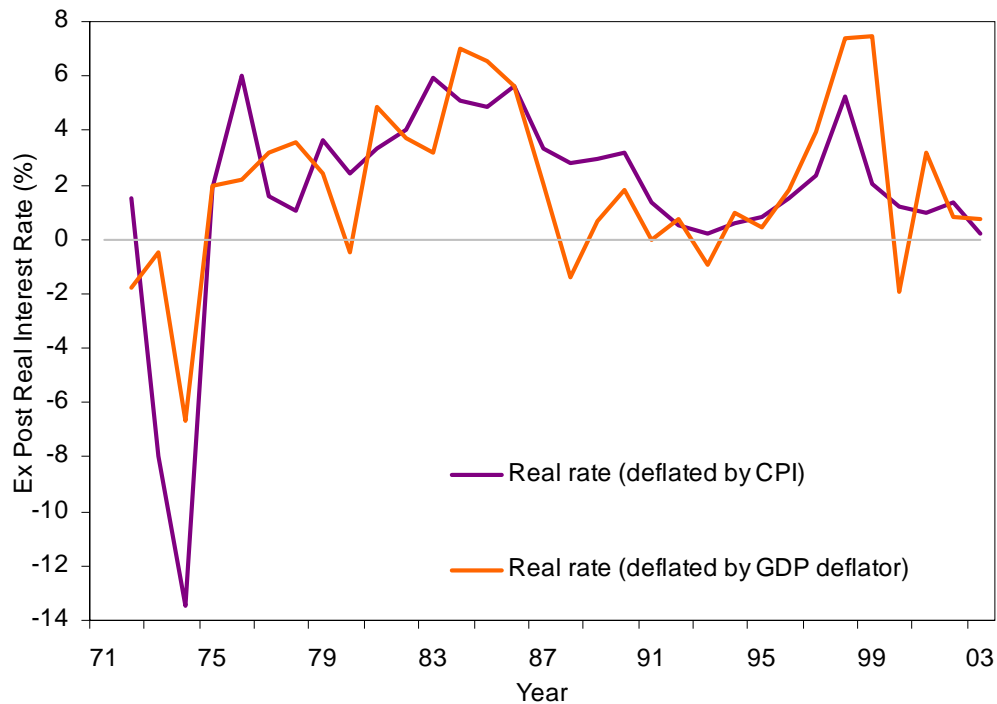
With the strong influx of foreign direct investments flowing into the economy bringing in its wake large numbers of job openings, the image of the first two decades after independence is that of the arrival of a big wave. The wave was so strong that despite several adverse shocks that hit the economy during this period---the withdrawal of the British troops in 1968, the two major oil crises in 1973-74 and 1979, and the US recession in 1981-82---there was a relentless decline in the rate of unemployment. But could this be counted on to continue unabated? Does success itself set in motion changes that would attenuate future employment expansion?

The Golden Decade and the Turbulent Years

At the end of the two decades of relentless employment expansion, a huge spike in the unemployment rate suddenly occurred in 1986. How do we explain that? One possible explanation might be that diminishing returns to capital had finally set in so the labour-demand curve could no longer continue its relentless shift to the right, at any rate, not at

the pace it did in the past. It is also possible that the high interest rate environment in the first half of the 1980s acted to push the labour-demand curve to the left (see Figure 4). On top of these influences on labour demand, two decades of rapid growth had also raised the wealth levels of the workforce, which would have made workers more eager to bargain for higher wages at any given level of labour-market tightness. In terms of Diagram 2, there was an upward shift of the wage-setting curve that occurred in tandem with the leftward shift of the labour-demand curve with the result that the level of labour-market tightness fell. In terms of Diagram 1, the ray from the origin moved in a clockwise direction giving rise to a higher rate of unemployment and a lower vacancy rate in 1986.

Figure 4
Real Interest Rate

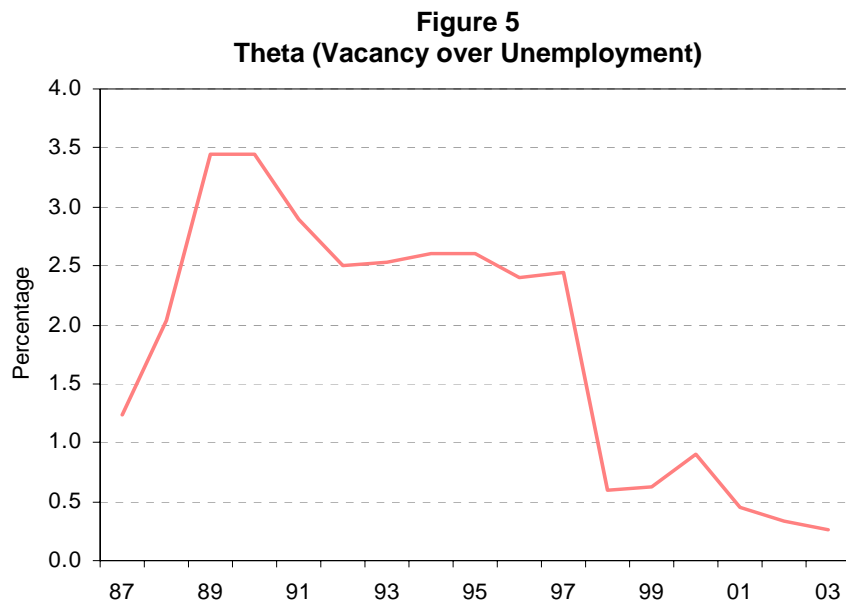


Source: International Financial Statistics

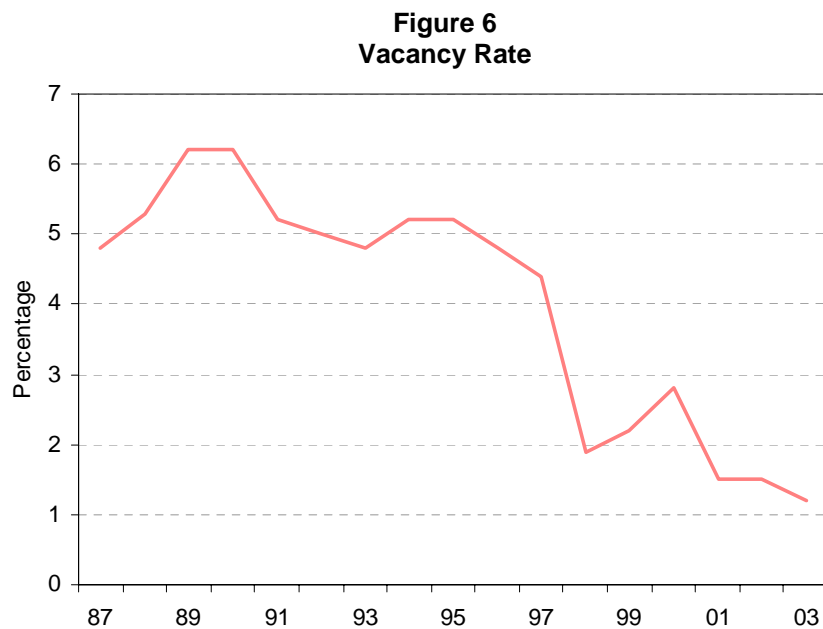
If my thesis is right that after the relentless shift of the labour-demand curve in the catch-up phase from 1966-85, the predominant shift was that of the wage-setting curve that moved upwards as workers' wealth rose so they increasingly hardened their bargaining position, why is it that we then observed a decade from 1989 to 1998 of such low unemployment rate, roughly at 2 percent? Wouldn't we expect to observe a steady decline in the measure of labour-market tightness along with steadily rising unemployment? We find from looking at Figure 5 that, in fact, since 1989 the level of labour-market tightness was indeed declining so there were increasingly fewer job vacancies per unemployed worker while Figure 2 shows that real wages were also rising during the golden decade. This pattern is consistent with an upward shift of the wage-setting curve that exceeded any upward shift of the labour-demand curve that occurred. The reason that the unemployment rate could remain so low (at about 2 percent) when the level of labour-market tightness was declining must be that the Beveridge curve in Diagram 1 was shifting inwards towards the origin even as the ray from the origin was moving in a clockwise direction. The result is that the vacancy rate was declining (see Figure 6) at a roughly unchanged rate of unemployment.

What is it that caused the Beveridge curve to shift inwards? The golden decade coincided with two important events: the first was a booming regional economy that led to a thriving financial sector as funds flowed into the region and the second was that the world set off on the telecommunications and internet boom. Singapore had the ready supply of IT-trained personnel as well as financial sector workers needed to fill many new vacancies that were created as a result of these two events. Consequently, job

matching was relatively easy, implying an inward shift of the Beveridge curve. The array of points in Figure 7 that correspond to the years of the golden decade seems to suggest that just such a shift of the Beveridge curve occurred.

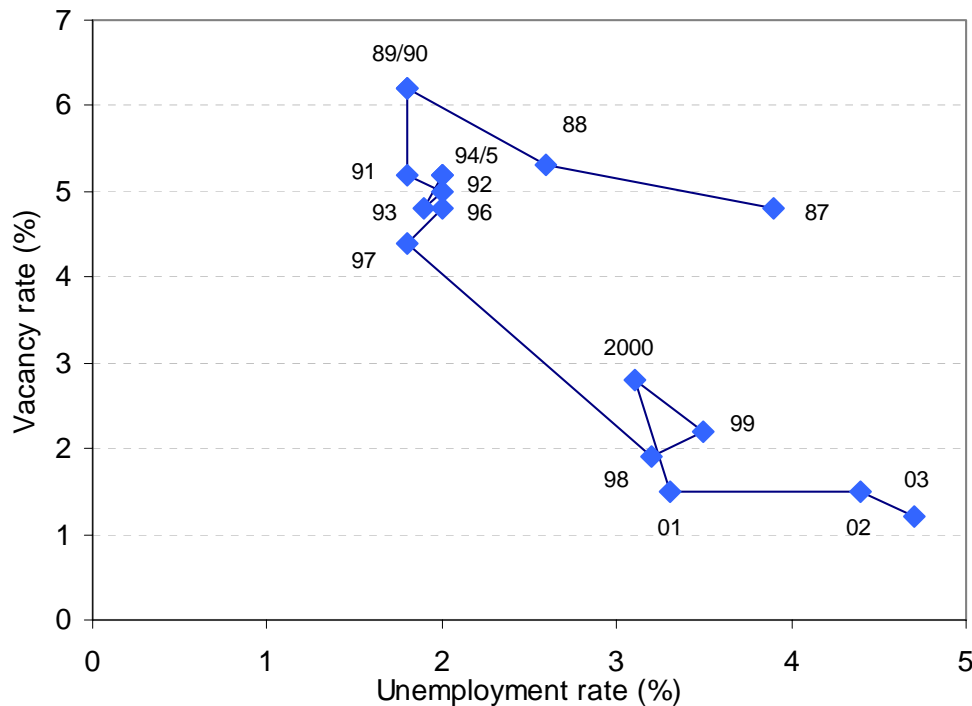


Source: Ministry of Manpower



Source: Ministry of Manpower

**Figure 7
Beveridge Curve**

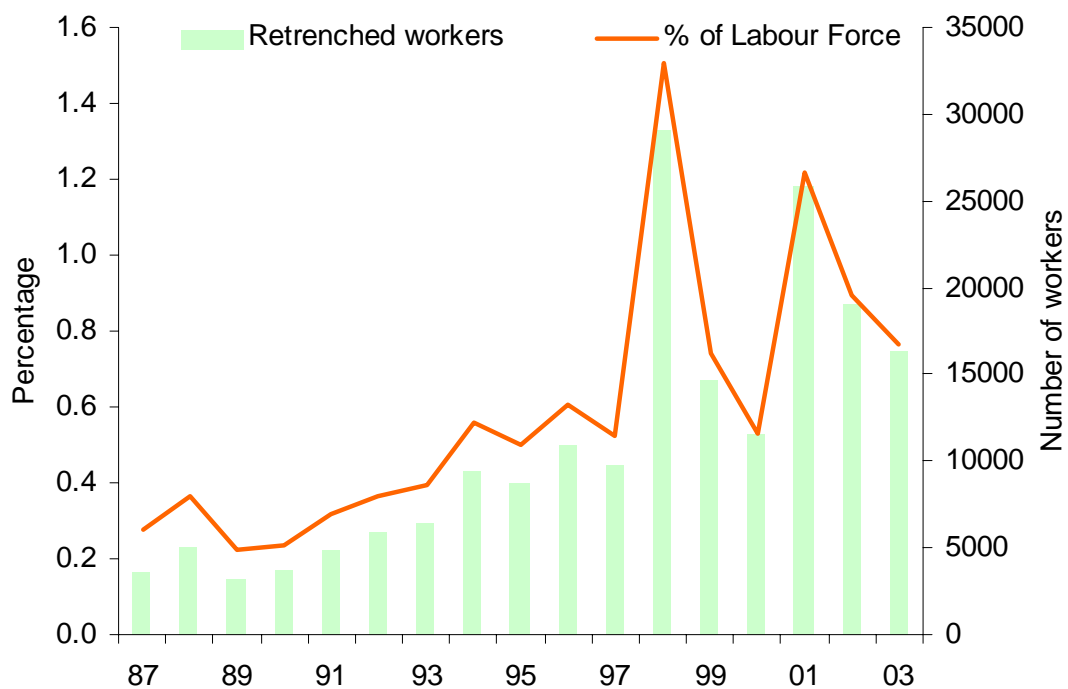


Source: Ministry of Manpower

The favourable events that we have associated with the golden decade, however, turned nasty with the onslaught of the Asian financial crisis that began in 1997 and the end of the internet boom in 2001. Figure 8 shows that the retrenchment rate, which we shall use as a proxy for the job separation rate, jumped up in 1998 and 2001. In terms of Diagram 2, the upward jump in the job separation rate translates into a leftward shift of the labour-demand curve. Juxtaposed against the wage-setting curve, this implies a drop in the level of labour-market tightness. In terms of Diagram 1, there is a clockwise movement of the ray from the origin so that, juxtaposed against a downward-sloping Beveridge curve, there is a drop in the vacancy rate and a rise in the unemployment rate. Without a big wave like that which we saw in the catch-up phase, adverse shocks---not just the contagion effect from the Asian financial crisis and the end of the internet boom

but also the effects of SARS---now translated into big declines in growth of real wage earnings and levels of labour-market tightness. (In contrast, during the catch-up phase, adverse shocks such as the oil shocks of 1973-4 and 1979 and the US recession of 1981 made little noticeable impact on the registered rate of unemployment.)

Figure 8
Number of Retrenched Workers and Retrenchment Rate



Source: Ministry of Manpower

Back to the Future

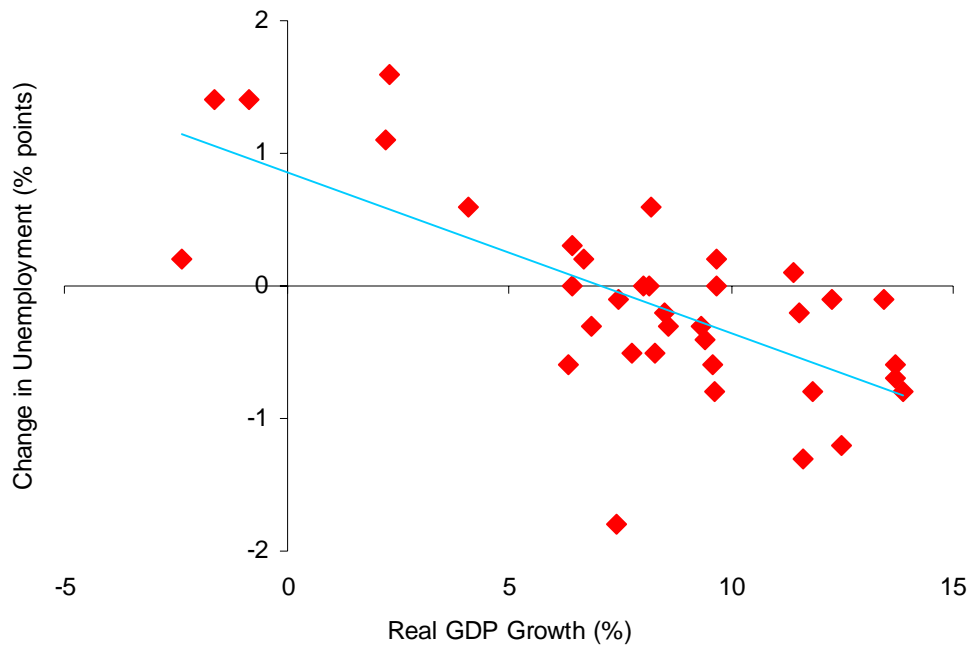
How do job prospects look like as we look to the future? Is the climb in the unemployment rate we see in Figure 1 after 1998 set to continue to rise to reach a higher plateau perhaps? One way to think about whether the unemployment rate will remain at its current level (at 3.4 percent at the time of writing, November 2004) or can be expected to rise further is to ask yet another question: Based upon historical experience, what is the

rate of growth of real GDP that will be required to keep the unemployment rate steady? Table 2 presents the results of regressing the change in the unemployment rate on the rate of real GDP growth for the period 1967-2002. Figure 9 presents a graphical representation of what is sometimes called “Okun’s Law,” a statistical relationship between the change in the rate of unemployment and the rate of GDP growth. We find that based upon our historical experience, it would be necessary to achieve an annual growth rate of real GDP of 7.1 percent in order to keep the unemployment rate unchanged. The Okun’s Law relationship also tells us that, historically, a one-percentage point shortfall of the real GDP growth rate below 7.1 percent in any given year results in a rise in the unemployment rate of 0.12 percentage points over the previous year. Achieving an average annual growth rate of 9.1 percent in a given year, say, leads to a decline in the unemployment rate of 0.24 percentage points over the previous year producing a transition of approximately 5,000 workers from an unemployed to an employed status. As a statistical matter, it comes as no surprise that our unemployment rate made such an impressive decline over the span of the past three decades since we have managed to achieve growth rates in excess of 7.1 percent over so many years.

Table 2
Regression Results for Okun’s Law

Dependent Variable: Change in Unemployment Rate (percentage points)		
<i>Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>
Real GDP Growth	-0.1211	0.0221
Constant	0.8577	0.2013
R-squared: 0.47		
F-statistic (p-value): 29.91 (0.00)		
Durbin-Watson: 2.16		

Figure 9
Scatter Plot of Change in Unemployment Rate vs Real GDP Growth Rate



Source: Ministry of Manpower

To be able to make use of the Okun's Law relationship to predict where Singapore's unemployment rate is likely to head, we need to have a theory that gives a causal link between the unemployment rate and the economic growth rate. What is a plausible theory underlying such a statistical relationship? What is the significance of the growth rate at which the unemployment rate neither rises nor falls? Conceptually, it is useful to imagine a balanced growth path along which an economy might find itself characterized by a constant level of labour-market tightness, a constant unemployment rate and a corresponding constant job vacancy rate, as well as a constant rate of real wage growth. To be in such a balanced-growth state would require that workers bargain for wage increases at the rate that the economy will actually grow at. If workers' forecast of growth falls behind the actual growth performance, the wages they bargain for would turn

out to fall below the wages that firms can actually afford to pay them with the result that firms will find it profitable to expand employment. Consequently, the unemployment rate declines when workers under-forecast growth. On the other hand, if the economy turns out to be more anaemic than workers actually forecast, the wages that workers bargain for will turn out to be unaffordable for firms with the result that more workers will have to be laid off. Consequently, the unemployment rate rises when workers over-forecast growth. Only when workers' growth forecast is largely borne out by experience will the unemployment rate remain steady. Based upon our historical experience since independence, the balanced-growth state appears to coincide with an average annual growth rate of 7.1 percent. Consequently, if the economy is able to generate at most 5 percent real GDP annual growth rate (the high end of the range of official medium-term projections of our economy's growth rate, which is 3 to 5 percent), it would seem that the unemployment rate would simply have to continue to rise from its current level based upon the historical relationship.

Is there any reason, however, to believe that the Okun's Law relationship for a fast-developing country like ours might be expected to change once we have reached the status of a mature economy as we now have become? In other words, is it possible that the negatively-sloped line describing the Okun's Law relationship in Figure 9 might shift towards the origin as the economy matures, which implies a decline in the real GDP growth rate required to keep the unemployment rate steady? After all, in a mature economy like the US, the critical real GDP growth rate required to keep the unemployment rate steady is a few percentage points below the 7.1 percent we calculated

for Singapore based upon our historical relationship. It would seem very likely that the Okun's Law relationship would indeed shift as the economy matures. As workers adjust their expectations to the reality that the economy has reached a new growth regime corresponding to slower growth and they incorporate their revised growth expectations in wage bargaining, they would reach a new (lower) balanced-growth state. The unemployment rate can, therefore, be expected to continue to rise only insofar as workers continue to overestimate the economy's growth potential. Thinking in this way suggests that an important job for policy makers is to manage workers' expectations, something that may not be easy to do since older workers remember the phenomenal improvement in their job situation over their life cycle and expect this to continue while new workers remember the great improvement their own parents experienced and believe that to be the normal course of events for them too. Paradoxically, the negative shocks that the economy experienced during the recent turbulent years of 1998-2003 may have helped workers to revise their expectations downwards, which would obviate the need for the economy to continue to suffer rising unemployment to force workers to match their expectations to reality.

We have argued that there is no reason for the unemployment rate to continue rising once workers come to a more realistic estimate of the economy's new (lower) growth potential but have not provided any answer to the question: What will determine the equilibrium volume of joblessness once the economy has settled down to the new balanced growth path and workers' expectations are realistically set? It seems to me that a couple of reasons suggest that the equilibrium rate of unemployment in the lower

growth regime will be higher than the corresponding rate in the high balanced-growth regime. First, for a given world interest rate, which our small open economy takes parametrically, a decline in the economy's potential growth rate is likely to reduce the pace at which firms are likely to create new job openings. This is because firms evaluate the future contributions of workers to their profit stream when they commit current resources to create job vacancies. When the potential growth rate is high, firms are very willing to bring forward new job openings since they expect huge contributions to the profit stream from their current new hires. Conversely, when there is a decline in the potential growth rate at any given real interest rate, firms are more reluctant to commit current resources to open new job vacancies. In terms of Diagram 2, there is a leftward shift of the labour demand curve. Second, just as the Beveridge curve in Diagram 1 shifted towards the origin during the golden decade when the booming regional economy and internet boom found a ready supply of white-collar workers to fill new job openings in the financial and information sector, it is likely that the Beveridge curve can now be expected to shift out as low-skilled blue-collar workers find that they are unsuitable to fill the new job vacancies which require a set of skills they don't possess.

In response to the worsened medium to long term outlook for the labour market, one is tempted to ask: Can anything be done by policy-makers to reduce the equilibrium rate of unemployment in this new balanced-growth state? Some might argue that aggregate demand policy---an expansionary monetary policy, an expansionary fiscal policy, and an exchange rate policy aimed at improving international competitiveness---can be used to lower the unemployment rate. In reply, it can first be pointed out that

maintaining our status as an international financial centre with little restrictions on cross-border capital mobility and a commitment to maintain exchange rate stability (and hence price-level stability) implies that the country cannot also exercise independent monetary policy---the classical policy trilemma problem facing open economies. Having given up an independent monetary policy, can't the Monetary Authority of Singapore now aim at weakening the Singapore dollar to boost international competitiveness, and so create jobs by increasing aggregate demand through discouraging imports and encouraging exports. This policy, however, has the risk of inducing competitive devaluations by other countries making it, in effect, a beggar-thy-neighbour policy. Moreover, if the exchange rate is frequently used as an anti-recessionary tool, it leads to greater exchange rate variability, which may discourage foreign direct investments, and produce greater variability in domestic inflation.

Others might argue: Since the country has already accumulated such a large stock of foreign reserves, isn't it time to adopt a consistently expansionary fiscal policy now through both a substantial cut in tax rates and a steady increase in government spending? What reason is there for the country to continue to run structural fiscal budgetary surpluses in the future? Although common sense suggests that it cannot be right that we aim to increase government assets through running surpluses without bound, three considerations suggest that our optimal fiscal position is in the direction of more structural surpluses. The first consideration is that our commitment to remain integrated into the world economy through free international capital flows means that we are vulnerable to currency crises. In order to develop an immunity against currency crises,

Martin Feldstein (1999) has suggested that a country needs to increase its international liquidity position in the sense of increasing its foreign exchange reserves as a ratio to its short-term foreign liabilities. This stock of foreign reserves can be built up gradually through generating fiscal surpluses. The second consideration is that our changing demographics will, by itself, imply increased demand on government resources in the future for health needs. Moreover, Franco Modigliani's life-cycle theory of saving (see Modigliani, 1975) suggests that in the 1960s, when the young-age dependency ratio was high, saving was low. Then, when more of the population was in the working age category, saving increased. However, with longevity, a time will come when the old-age dependency ratio will rise and then saving will be reduced again. We should therefore save more now. The third consideration applies the logic of precautionary saving at the level of the individual to the state. If we are committed to remain open, to be integrated into the world economy, in order to continue to grow, we face the inevitability of being vulnerable to external shocks. Just as individuals save above the normal level for the proverbial rainy day, a country has to have additional resources to distribute to those who are hurt by the country's openness in order to maintain the social cohesion necessary to stay open. Hence, while an expansionary fiscal policy is a useful complementary measure to use in severe recessions, longer-term considerations may argue against using it mainly as a tool to create jobs by expanding aggregate demand.

If I am right that there are severe limits to the use of expansionary aggregate demand policy as a means of lowering the average rate of unemployment, can wage reform do the job? I believe that the major case for wage reform is not that it will lower

our average rate of unemployment in the future. Instead, it is to provide a substitute for the use of major cuts in employers' Central Provident Fund (CPF) contribution rates as a means of saving jobs when huge adverse shocks hit the economy. Without the option of making huge downward adjustments in firms' calculation of the marginal cost of hiring a worker, big adverse shocks that hit the bottom line of a substantial number of firms will result in a big layoff of workers. In the past, when the economy faced sharp recessionary shocks, major cuts in the employers' CPF contribution rates were promptly implemented. A cut in employers' CPF contributions, though it has the advantage of being applied across the board, if used too frequently compromises the purpose of the CPF as a social security system. This then leaves greater wage flexibility, in particular, downward flexibility as a necessary tool to minimize job losses when the country is faced with an adverse external shock. Since there are forces tending to raise Singapore's structural rate of unemployment, having a more flexible wage structure allows the country to at least avoid large increases in cyclical unemployment.

It might not be an easy matter, however, to push *all* companies to shift from fixed to flexible pay for reasons that have to do with risks, incentives, and measurement costs. (a) Risks: If workers are highly risk averse, they would strongly prefer a fixed wage to a variable wage that pays them the same expected amount on average. Then if one firm moves to the variable pay method while the other firms have not or do not, it stands to lose its workers to those competitors who are slower to implement the flexi-wage scheme. Workers basically have to be convinced that to have increased employment stability they would have to accept reduced wage stability. Possibly, the

recent spate of job losses due to a series of adverse shocks---SARS, end of internet boom, financial sector restructuring, etc.---has helped workers to come to accept this reality of a trade-off between job security and wage certainty better. (b) Incentives: Varying wages affect the incentive of workers to exert their work effort, and go the extra mile in their work. Announcing to workers that their pay would be cut can lead to a loss of morale, which ultimately hurts the bottom line of firms, if they do not feel that the pay cut is justified. A lot of energy would, therefore, have to be exerted at the firm level to create a transparent accounting system so that any firm's workforce is convinced that any pay cut is justified, especially if other firms in the economy seem to be doing well. (3) Measurement costs: To move from a fixed to a variable wage system, it becomes very important to be able to measure how well each worker's effort is tied to the company's performance. This may be easy to do in some businesses, like the manufacture of umbrellas, for example, but much more difficult and hence more costly to do, in other businesses, say, in a consultancy business. Therefore, a cost-benefit analysis conducted by each firm or industry regarding how far it will go towards a move to a flexible-wage system would very likely come out with somewhat different answers for different firms or industries. Some firms or industries would find it optimal to go further in the direction of wage flexibility more than others.

If expansionary aggregate demand policy and wage reform are not the panacea for structural unemployment, can anything else be done? There are two possible responses here. The first is to say that there are, indeed, some things that can be done that affect the structural rate of unemployment directly, namely policies that directly affect job creation

and firm-worker matches. On job creation, one proposal that merits serious consideration is the introduction of an employment subsidy scheme that subsidizes firms that hire low-skilled workers. In terms of Diagram 2, a subsidy creates a wedge between the wage-setting curve and the labour demand curve so that a worker's take-home pay is higher than what the firm actually pays, the difference being made up by the subsidy paid for by the government. Is there any economic justification for society to foot the bill for implementing an employment subsidy scheme? If we accept the argument that a society suffering from a high incidence of long-term joblessness creates serious negative externalities for the rest of society through such things as a loss of respect for common property and increased crime and theft, there would seem to be a case for the state to pay from out of its total tax revenue an employment subsidy to bring the equilibrium rate of unemployment down to a level below that prevailing without any government intervention. The reader's attention is drawn here to Phelps (1997), which presents a cogent argument for the introduction of an employment subsidy scheme and calculates the cost of implementing such a scheme in the US. Creating a more conducive business environment, in particular one which places few barriers towards the creation of new firms, also acts to shift the labour demand curve to the right and so increases labour market tightness and reduces the rate of unemployment. On improving firm-worker matches, the newly created Workforce Development Agency provides relevant training for unemployed workers and attempts to match them with firms requiring workers with the new skills. The fact that we are geographically a small country will give us an advantage in matching workers to jobs.

The second response is to accept that despite the effort to train unemployed workers, some will continue to remain unemployable. The relevant question then is whether society will be willing to pay for some minimal level of unemployment benefits or provide some alternative means of social insurance to soften the financial impact of being out of work. We have been able in the past thirty-five years or so to keep government spending as a ratio of GDP at about 20 percent, which is about half the level of other OECD countries despite our high degree of openness. (Our trade to GDP ratio is about 300 percent.) I believe that we were able to do so from about 1965 onwards because our priority in spending on the economic infrastructure—not simply good roads and industrial estates but also investing in good people in the civil service who created a business-friendly environment for foreign investors—led to a wave of foreign direct investments and catapulted us into catch-up growth that translated into good jobs and reasonably good pay. So there was no demand for things such as unemployment benefits. Catch-up growth has more or less petered out by now. (We were at about 20 percent of US income level on a purchasing power adjusted basis in the early 1960s and now at about 90 percent.) The rush of factories in Singapore in search of relatively unskilled but hardworking workers is also over. In order to grow requires a move away from accumulation to innovation. Yet this innovative phase still requires a deep integration into the world economy. I noted earlier that our measure of labour-market tightness was declining as the wage-setting curve was shifting up through the wealth effect without being offset by strong rightward shifts of the labour-demand curve. The reason we were able to achieve roughly 2 percent unemployment rate despite the steady decline in labour-market tightness is that our economy had the right institutions and people to ride on the

periodic wave that came our way when the regional economy boomed and an internet revolution occurred. These opportunities came because we remained open to the international economy. However, staying integrated to the world economy means that we are going to be subject to negative external shocks periodically but now without the benefit of the earlier wave of job-creating foreign direct investments helping us to absorb the shock. In this climate, political reality requires that there be increased social spending to help the disadvantaged just simply so that social cohesion be maintained. The key thing is that any society has to choose a point on the trade-off schedule between equity and efficiency. With changes in technology and our comparative advantage shifted against the less skilled, we will need to actively redistribute more towards those at the lower end of the income scale just to maintain the same combination of efficiency and equity point we had before. Consequently, I believe that just to keep a policy of being integrated into the world economy viable, we will need to increase our share of the national pie on providing social safety nets. The challenge is to provide an adequate cushion from shocks without stifling incentive too much. Research suggests that, in designing our own mix of social safety nets, we should try to aim at providing the economy with enough flexibility to respond to changes in the world economy. There is no one-size-fits-all model for devising social insurance. We will have to draw from our historical experience and cultural context to develop our own unique set of social safety nets.

Conclusion

When the country gained independence in 1965, creating employment for the large pool of jobless individuals was a major challenge facing the government. The route that we took to bring the unemployment rate down was not that of Keynesian aggregate demand policy via monetary expansion or fiscal pump-priming. Instead, we focused our attention on building an institutional environment that was conducive to the setting up of businesses, especially foreign enterprises with financial resources and access to the world market, and promoting a hardworking and reliable workforce even if not one that was particularly skilled. As the first foreign enterprises setting up shop in Singapore spread the word around that Singapore was a reliable place to set up factories to produce items for sale into the world market, a fresh flow of new foreign direct investments came in, which created a wave of new jobs. That flood of new jobs was so big that despite several adverse shocks to the economy---the withdrawal of British troops in 1968, the two world oil crises in 1973-74 and 1979 and the global recession in 1981---there was hardly a dent on the registered rate of unemployment. Instead, there was a relentless decline in the unemployment rate from close to 9 percent in 1966 to about 3 percent in the early 1980s without fueling inflationary pressures, a sign that it was the structural rate of unemployment that was steadily decline during this catch-up phase. It was not the increased supply of jobs brought in by the flood of foreign direct investments and associated growth of small and medium-sized enterprises that acted singly to bring down the equilibrium rate of unemployment. The fact that workers' expectations of future growth prospects were not particularly bright for a newly-independent country (after all, whether such a small nation without an important hinterland could survive was a serious

question) also meant that they were not particularly choosy about jobs, being glad simply that they were able to find employment with a reasonable living wage. The result was that firms found it profitable to hire a large number of them, which steadily brought down the unemployment rate.

The year 1986 might have marked an important turning point for the economy. By then, workers had lived through two whole decades of phenomenal growth and associated increases in wealth levels and so came to feel emboldened to bargain for higher wages at any given level of labour-market tightness. Ironically, by this time, diminishing returns to capital accumulation might also have set in implying that the wages workers felt emboldened to bargain for were getting ahead of the wage levels firms could afford to pay. The result is that from about 1989 the number of job vacancies per unemployed worker (an indicator of the tightness of the labour market) began a steady decline. Yet, the unemployment rate remained stable at its lowest level of about 2 percent for the period 1989-1998, the golden decade. What prevented the economy's unemployment rate from starting to creep up despite the bargained wage getting ahead of the affordable wage during this period is that the economy had a ready supply of trained information technology workers and business graduates to fill up positions created by a booming regional economy and onslaught of the internet revolution. Our commitment to stay integrated into the global economy and the investment in skills training and education made the economy ready for the periodic wave of opportunity thrown up by the new technology and evolving world economy.

I believe that, ultimately, it is this commitment to develop institutions that make our economy able to seize on new opportunities brought about by new technology and an evolving world economy that will allow the country to obtain unusually low rates of unemployment such as occurred during the golden decade of 1989-1998. However, remaining globally connected in order to ride on waves of opportunities also means exposing ourselves to the vagaries of the ups and downs of the world economy. Without the strong inflows of foreign direct investments in search of low-skilled but reliable workers that we had in the first two decades after independence to counteract the job destructive effects of adverse external shocks now, there is a great need for the country to seriously consider a more adequate provision of a social safety net to soften the financial impact of joblessness that is most likely to be concentrated among the less skilled workers. Reaching out for a weaker Singapore dollar in order to boost international competitiveness, and so to boost aggregate demand and hence employment, or reaching out for budgetary deficits as a direct means to boost aggregate demand is unlikely to have a lasting effect on the structural rate of unemployment. It would be better to consider policies aimed directly at influencing equilibrium unemployment. One proposal to seriously study is the feasibility of introducing an employment subsidy scheme aimed particularly at low-skilled workers, which has the effect of increasing job creation directly. Further effort to create a business-friendly environment that will encourage new start-ups to test new ideas in the marketplace by ensuring minimal red tape and enabling relatively easy financing for them will also work to increase the pace of job creation. Finally, the good work of the Workforce Development Agency and Community Development Councils aimed at retraining low-skilled and older workers to meet the

skills demand of new jobs and then matching them to firms offering the job vacancies should help somewhat in bringing down, or at any rate temper the rise of, the structural rate of unemployment as our small geographical area works to our advantage when it comes to job-matching.

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